

STP RESEARCH RESULTS

Does Music Make You Smarter?

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OCTOBER 25, 2019

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Executive Summary

About this Research

This report examines the relationship between the academic performance of students who completed music courses in high school with their grade 12 graduation and post-secondary education outcomes. Do students with music experience achieve higher education achievement than students without music experience? This study was motivated by the recent research results revealed by Peter Gouzouasis, a UBC professor in the Faculty of Education. He found that "... music has a significant and measurable impact on academic achievement, and the more of it kids do, the better they do in their academics."

This study was conducted by the Student Transitions Project (STP), a collaborative research partnership involving B.C.'s education and advanced education ministries and post-secondary institutions.

Quick Facts

What proportion of high school graduates had music education experience in high school? From the cohort of 710,652 B.C. grade 12 graduates of 2001/2002 to 2016/2017, a total of 147,268 students (or 20.7% of the cohort) had taken at least one high school music course before graduating from grade 12. (See [page 13](#)).

What are the ten-year trends in the share of students graduating from grade 12 with music experience? Over the last ten years, from 2007/2008 to 2016/2017, the proportion of students with music experience has remained above 22%, increasing from 22.8% in 2008/2009 to a high of 23.7% in 2012/2013. (See [page 14](#)).

Are there any differences in the proportion students with music experience, by gender? A greater proportion of female students (22.5%) had music experience in high school than male students (18.9%). (See [page 20](#)).

About the STP

The Student Transitions Project is British Columbia's collaborative research project that measures student success from the K-12 to post-secondary systems. This effective system-wide partnership, involving B.C.'s education and advanced education ministries and public post-secondary institutions, is tracking student success by reporting on student transition rates to post-secondary education, student mobility among post-secondary institutions, and post-secondary completion and retention rates. The STP is managed by a steering committee with representation from the two education ministries, public institutions and the B.C. Council on Admissions and Transfer (BCCAT).

STP Steering Committee Members

Robert Adamoski, Chair, STP Steering Committee and Director, Admissions and Research, BCCAT.

Stephen Salem, Director and Registrar, Institutional Research, Coast Mountain College.

Leila Hazemi, A/Director, Research and Analytics, Ministry of Advanced Education, Skills and Training.

Nicole Gardner, Director, Education Analytics, Ministry of Education.

Tony Eder, Executive Director, Academic Resource Planning, University of Victoria.

Special Thanks

The STP would like to thank the Ministry of Education, the Ministry of Advanced Education, Skills & Training and the B.C. public post-secondary institutions for collaborating in this research effort. Without their co-operation and data contributions, this research could not have been accomplished.



For More Information

A wealth of additional information is also available to post-secondary institutions seeking more detailed information on student transitions specific to their region or institution.



STP reports, newsletters and other public resources are available on the public Student Transitions Project web site at:

<http://www2.gov.bc.ca/gov/content/education-training/post-secondary-education/data-research/student-transitions-project>

What was the range in the proportion of students with music experience, by primary language spoken at home (as a proxy for ethnic origin)? Students who primarily speak English at home, were less likely at 19.1% to have had music experience in high school when compared to other student language groups, including: Korean (45.5%), Mandarin (40.8%), Cantonese (33.7%), Chinese (33.7%), Japanese (32.3%), Tagalog (31.3%) and others. (See [page 21](#)).

How does the proportion of students with music experience vary by public versus private high school and region of the province? A greater proportion of students in private or independent high schools in B.C. had music experience (33.7%), than students who graduated from B.C. public high schools (19.3%). Vancouver Island independent school students had the greatest exposure to music in high school (42.8%), compared to public school students from the Cariboo-North region (13.7%). (See [page 22](#)).

Among students with music experience, on average, how many music courses did they take and what is the distribution of the number of music courses taken? Among students with music experience, they took an average of 2.25 courses. More than half (55.9%) of the cohort completed two or more music courses. (See [page 23](#)).

Among students with music experience, what is the distribution of courses by grade level, course recognition status and letter grade? The music courses were spread roughly equally over grades 10, 11 and 12 and these were primarily graded by the school (95%), and a smaller proportion (5%) were external courses that were granted credit by the high school, such as Royal Conservatory of Music. The majority of all music grades awarded were A's (74%) and B's (18%). (See [page 24](#)).

Do students with high school music experience achieve higher education outcomes than students without music experience? Compared to students without music experience, students with music experience achieved higher average iGPA scores (80.3 versus 76.7), higher AGPA scores (83.8 versus 81.6) and higher immediate-entry transition rates (55.7% versus 51.1%). Students with music experience who enrolled in post-secondary education were more likely to enrol in a research-intensive university (41.1%) than non-music students (27.2%). Music students in the cohort also achieved higher post-secondary credential completion rates and were more likely and faster to earn a Bachelor's degree than non-music students (29.7% in 4.4 years versus 22.6% in 4.6 years). (See [page 25-27](#)).

Are there proportionately more students with music experience among high academic achievers than moderate achievers? When comparing students with high academic achievement to those with moderate academic achievement, it was found that:

(a) A larger proportion of music students were found among the group of students with high iGPA's than those with moderate iGPAs (24.8% versus 14.9%). Similar results were found for high versus moderate AGPAs (27.5% versus 19.0%).

(b) Roughly equal proportions of post-secondary transitioners (20.8%) and non-transitioners (20.7%) had music experience, but this varied by time of entry, but there were larger differences when transitioners and non-transitioners were examined separately.

(c) A larger proportion of immediate entry students had music experience in high school (22.0%) than delayed-entry students (17.0%). High achievers among immediate-entry and delayed-entry students had proportionately more music experience than moderate achievers.

(d) A slightly larger proportion of completers of any post-secondary credential had music experience in high school (21.5%) than non-completers of any post-secondary credential (20.3%). Among both credential completers and non-completers, a greater proportion of music students were found among high achievers than moderate achievers.

(e) When looking specifically at Bachelor's completers versus completers of other credential categories, the STP found that a larger proportion of Bachelor's completers had music experience in high school (26.5%) than those who completed a developmental credential (19.3%) or some other credential (17.8%). Regardless of the type of credential completed, a larger proportion of high achievers had music experience than moderate achievers. (See [page 28-29](#)).



Do students with music experience achieve higher grades in selected high school courses?

It is possible for the STP to look at each of the courses required for graduation, but in this study, only the Grade 11 Math scores were examined. A larger proportion of students with music experience achieved A's and B's in Math 11 courses (62.9%) than students without music experience (51.2%). (See [page 30](#)).

Do students achieve higher iGPA scores, the more music course they take? There appear to be diminishing returns after six music courses, but it appears that the more music courses students take in high school, the higher their iGPA score upon graduation from grade 12. (See [page 31](#)).

Does music make you smarter or do smart kids take music? This STP study looked only at correlations between music experience and academic achievement, thus we cannot answer this question. Earlier student academic achievement information (in elementary school or junior high school years) would be needed to allow for a comparison to subsequent academic achievement in senior secondary school years. More longitudinal data might allow the STP to determine if the early high school music experience had any effect on later academic achievement. (See [page 32](#)).

STP Measures of Secondary School Academic Performance: AGPA and iGPA

Two academic performance measures are used by the STP in complementary ways to evaluate student academic performance achieved in high school and the impact this performance has on student transition rates and post-secondary academic performance: Academic GPA (AGPA) and the Inclusive GPA (iGPA).

Academic GPA (AGPA) – This measure is typically used as an indicator of university eligibility. The AGPA is the average of four course grades, English 12 and the student's best three other academic grade 12 subjects. More than half of the students who completed grade 12 do not complete the necessary set of courses or achieve insufficient grades in order to calculate an AGPA. Thus the utility of the AGPA is limited to a subset of academically qualified students in the STP.

Inclusive GPA (iGPA) – This is a more broadly defined measure than the AGPA and it allows the STP to measure the academic performance of both grade 12 graduates and non-graduates. The iGPA is calculated from the average of twelve course grades selected from each of twelve subject areas for grade 10, 11 and 12 courses required for graduation. The best grade from each of the twelve subject areas is included in the iGPA calculation. In those cases where a student has not yet completed the requirements for all twelve subject areas, the iGPA is calculated on as many courses as are available for that student, from a minimum of one to a maximum of twelve courses per student. The twelve subject areas are based on the current grade 12 graduation requirements:

1) Planning 10	7) Skills and Fine Arts 10, 11, 12
2) Language Arts 10	8) Social Studies 10
3) Language Arts 11	9) Social Studies 11 or 12
4) Language Arts 12	10) Science 10
5) Math 10	11) Science 11 or 12
6) Math 11 or 12	12) Physical Education 10

Introduction

Background

According to Peter Gouzouasis, a UBC professor in the Faculty of Education, "... music has a significant and measurable impact on academic achievement, and the more of it kids do, the better they do in their academics." His study was published in the *Journal of Educational Psychology*¹ and came to the attention of the STP after the [Vancouver Sun](#) summarized some of his findings in their print edition of the newspaper on June 26, 2019.

Gouzouasis examined the associations between engagement in high school music courses and provincial exam results for more than 110,000 secondary schools students enrolled in B.C. public schools. He examined whether participation and engagement in school music was associated with academic outcomes in other school subjects, while controlling for sociodemographic background and prior academic achievement in grade 7.



Readers are encouraged to read the Gouzouasis study, but here is a brief summary of three key research findings.

- (a) Students who took music courses, compared to those who took none, achieved higher academic outcomes on high school provincial exams in math, science and English courses. There was little variation in results across subjects.
- (b) The positive effect on academic achievement was even greater for students who were highly engaged in music, or among students who took five or more music courses.
- (c) Student exam scores were more positively influenced by student participation in instrumental music courses than exclusive participation in vocal music courses. He noted numerous differences in rigor, activities and processes that may account for the difference in outcomes between instrumental and vocal students.

When the results of the Gouzouasis study were discussed with a high school band student at Burnaby Central Secondary School, her immediate response was: "Smart kids take band. Band does not make you smart!". The STP is able to confirm from the STP data that students who take music courses achieve better education outcomes than students without music experience, but the STP data does not allow us to confirm whether music causes academic success, or if it is a simple correlation. This STP study does not control for prior achievement in elementary school, nor does it control for

¹ Guhn, M., Emerson, S. D., & Gouzouasis, P. (2019, June 24). *A Population-Level Analysis of Associations Between School Music Participation and Academic Achievement*. *Journal of Educational Psychology*. Advance online publication. <http://dx.doi.org/10.1037/edu0000376>.

sociodemographic background. The STP has information available to broaden our understanding of Gouzouasis' findings and approached this exploratory analysis from two broad research questions.

1. **Do students with high school music experience achieve higher education outcomes than students without music experience?** This question is addressed by identifying those students who completed (or received credits) for at least one music courses in high school and comparing their education outcomes to students who did not complete any music course in high school. The education outcomes compared between the two groups include: (a) iGPA scores, (b) Academic GPA scores, (c) post-secondary transition rates, by time of post-secondary entry, (d) post-secondary destinations, and (e) post-secondary credential completion rates.
2. **Are there proportionately more students with music experience among high academic achievers than moderate achievers?** This question is addressed by comparing the relative proportions of students with music experience, among high achievers versus moderate achievers, across a number of different education outcomes: (a) average iGPA scores, (b) transition to post-secondary education, (c) time of entry to post-secondary education, (d) post-secondary credential completion, and (e) type of post-secondary credential completed. The academic benefits of participation in music in high school should be apparent if proportionately more of the high achieving students participated in music than the moderate achievers, for each of the education outcomes.

In the process of answering the above two broad research questions, a number of additional research sub-questions are presented in this report, with each question and answer presented separately along with some interpretation and a visual or tabular display of supporting quantitative information. The full **Research Results** begin on [page __](#), after a brief overview of the data sources, study cohort and definitions.

Data Sources

The information in this STP study is based on data collected and assembled in the STP from the Fall, 2018 submission. This includes sixteen years of data gathered from post-secondary institutions and the Ministry of Education, as follows:

- **B.C. K-12 enrolment data** for B.C. grade 12 graduates of 2001/2002 to 2016/2017;
- **B.C. K-12 secondary school course marks** for B.C. secondary school students of 2001/2002 to 2016/2017;
- **B.C. public post-secondary enrolments** for academic years 2002/2003 to 2017/2018;
- **post-secondary credentials awarded** in B.C. public post-secondary institutions in academic years 2002/2003 to 2017/2018.

Secondary School Music Courses

A total of 100 distinct grade 10, 11 and 12 music courses are included in this study. The majority of students who took a music course completed a band or choir course. Course codes change over time, such that some of the courses are not currently offered, but students in this study had completed these courses. A full list of the courses is provided on [page __](#).

Study Cohort

This study was based on a cohort of 710,652 students who graduated from grade 12 between 2001/2002 and 2016/2017. Among these students, a total of 147,268 (or 20.7% of the cohort) had completed a music course in high school (in grade 10, 11 or 12) prior to graduation. The majority of the cohort (563,384 students or 79.3%) had no music course experience in high school.

Of those 147,268 students who took at least one music course in high school, they took a total of 331,859 music courses, or an average of 2.3 music courses per student, prior to graduating from grade 12. These music courses were spread roughly equally over 3 grade levels: grade 10 (32%), grade 11 (38%) and grade 12 (30%). The majority (95%) of these music courses were graded by the student's high school, but a small portion (5%) of the music courses were completed elsewhere or granted credit with grades of SG (Standing Granted) or TS (Transfer Standing). These other music courses were likely externally completed music courses, such as Royal Conservatory of Music exams.

Definitions

Student Transitions: The subset of students who transition to post-secondary education are frequently referred to by the STP as **transitioners**. Depending upon the timing of their first enrolment in B.C. public post-secondary education, these transitioners may be **immediate-entry** students who enrolled within one year of high school graduation, or **delayed-entry** students who waited a year or more before enrolling in the B.C. public post-secondary education system for the first time.

Secondary school academic performance: The STP has two measures of academic performance of secondary school students, the Academic GPA (AGPA) and Inclusive GPA (iGPA). The AGPA is derived from academic grade 12 courses, whereas the iGPA is a more broadly defined measure derived from the average grades across twelve courses required for graduation. See the inset box, [STP Measures of Secondary Academic Performance](#) on page ____ for more information. Using the iGPA or AGPA scores, the STP divides students into high versus moderate achiever groups: **High Achievers** are those students with a GPA of 75% or higher; and **Moderate Achievers** are those students with GPA's of 50% or higher, but below 75.

Credential Categories by Study Level

The post-secondary study levels and credential categories used by the STP across the B.C. public post-secondary system are listed below in descending order of entry qualifications for the study level and credential category.

Graduate

- Doctorate
- Master's Degree
- Graduate Diploma
- Graduate Certificate

Undergraduate

- Post-Degree Diploma
- Post-Degree Certificate
- First Professional Degree
- Bachelor's Degree
- Advanced Diploma
- Advanced Certificate
- Associate Degree
- Diploma
- Certificate
- Apprenticeship
- Short Certificate
- Other
- None

Developmental

The classification of credentials within this study level varies across institutions, but may include a variety developmental certificates, short certificates, "other" or "none". The developmental study level is commonly used at B.C. colleges, institutes and teaching-intensive universities. Research-intensive universities do not submit any "developmental" student records to the STP. Please see [Figure 9](#) for more information on the typical programs included in this study level.

Secondary school courses: The STP has course grade information for students who have taken courses in B.C. secondary schools. The **students with music experience** are those students who have taken or received credit for at least one secondary school course with a 'MUSIC' subject category between 1995/1996 and 2017/2018. Some students in this study had taken multiple music courses. Many students also participate in private music lessons, such as piano, a common instrument of study among school-aged children and teens. The STP is able to identify students who received high school credit for some of these external music exams, but is unable to identify all students who had any music experience through private music classes. Not all students who receive music classes from an external provider will submit their exam scores for high school credits. It is believed that many of the students who took private music lessons had also participated in music classes offered in their secondary school.

Post-Secondary Enrolments: Based on the sixteen years of post-secondary enrolments, the STP has access to system-wide B.C. public post-secondary enrolment data encompassing various dimensions, such as:

- new/continuing students,
- domestic/international students,
- post-secondary institution, institution type, college region, B.C. region,
- study level (graduate, undergraduate, developmental), including continuing studies²,
- credential category and program, etc.

Post-Secondary Credentials Awarded: The post-secondary credentials included in this study are any of the numerous undergraduate, graduate or developmental credentials in B.C. public post-secondary institutions over the last sixteen years (see [Credential Categories by Study Level](#) inset box). Some institutions offer and award a wider range of credentials than others.

Exclusions: Students who transition to B.C. private institutions or non-B.C. post-secondary institution are excluded from these research results, although the STP will soon conduct research on transitions into B.C. private and non-B.C. institutions in the near future.

B.C. Public Post-Secondary Institutions by Institution Type

B.C.'s public post-secondary institutions belong to one of four institution types or sectors, as defined by the Ministry of Advanced Education, Skills and Training. All student mobility information in this study assigns each institution to its current institution type, as defined below.

Colleges – Camosun College, College of New Caledonia, College of the Rockies, Douglas College, Langara College, North Island College, Northern Lights College, Coast Mountain College (formerly Northwest Community College), Okanagan College, Selkirk College, Vancouver Community College.

Institutes – British Columbia Institute of Technology, Justice Institute of British Columbia, Nicola Valley Institute of Technology.

Teaching-Intensive Universities (TIUs) – Capilano University, Emily Carr University of Art + Design, Kwantlen Polytechnic University, Royal Roads University, Thompson Rivers University, Vancouver Island University, University of the Fraser Valley.

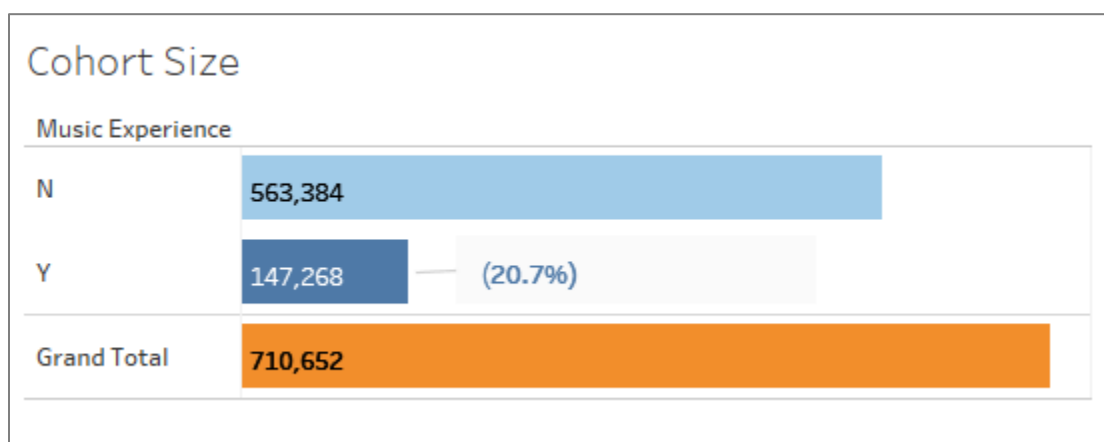
Research-Intensive Universities (RIUs) – Simon Fraser University, University of British Columbia (including University of British Columbia, Okanagan), University of Northern British Columbia, University of Victoria.

Research Results

What proportion of high school graduates had music education experience in high school?

From the cohort of 710,652 B.C. grade 12 graduates of 2001/2002 to 2016/2017, a total of 147,268 students (or 20.7% of the cohort) had taken at least one high school music course before graduating from grade 12.

FIGURE 1: MUSIC STUDY COHORT, BY STATUS OF MUSIC EXPERIENCE



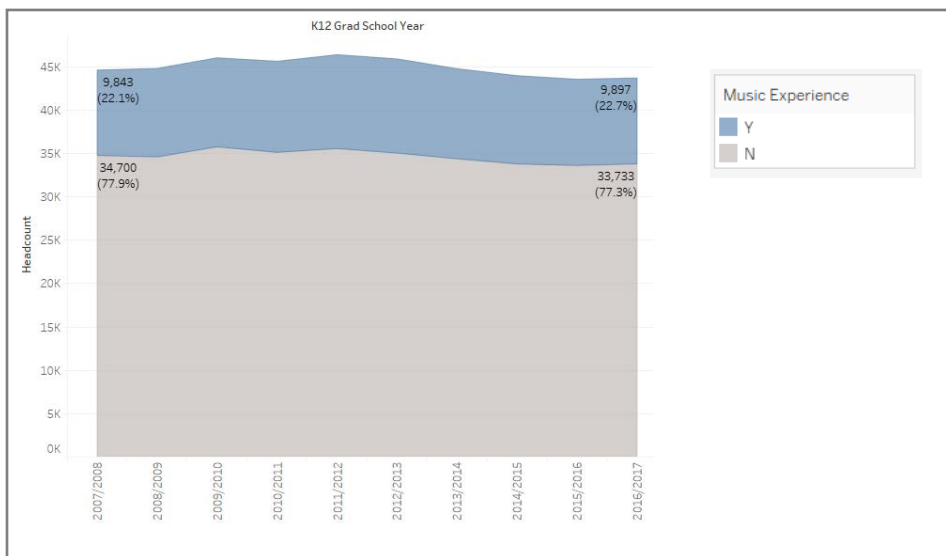
What are the ten-year trends in the share of students graduating from grade 12 with music experience?

Over the last ten years, from 2007/2008 to 2016/2017, the proportion of students with music experience has remained above 22%, increasing from 22.8% in 2008/2009 to a high of 23.7% in 2012/2013. Over the last five years, however, the proportion of grade 12 graduates with music experience has declined slightly, from 23.7% in 2012/2013 and declining to 22.7% in 2016/2017.

FIGURE 2: SUMMARY OF HEADCOUNT AND % SHARE OF GRADE 12 GRADUATES WITH MUSIC EXPERIENCE

K12 Grad School Year	Music Experience			
	Y		N	
	Headcount	Headcount %	Headcount	Headcount %
2007/2008	9,843	22.1%	34,700	77.9%
2008/2009	10,190	22.8%	34,540	77.2%
2009/2010	10,260	22.3%	35,696	77.7%
2010/2011	10,496	23.0%	35,057	77.0%
2011/2012	10,821	23.4%	35,494	76.6%
2012/2013	10,853	23.7%	34,974	76.3%
2013/2014	10,379	23.2%	34,320	76.8%
2014/2015	10,174	23.2%	33,720	76.8%
2015/2016	9,934	22.8%	33,547	77.2%
2016/2017	9,897	22.7%	33,733	77.3%
Grand Total	102,847	22.9%	345,781	77.1%

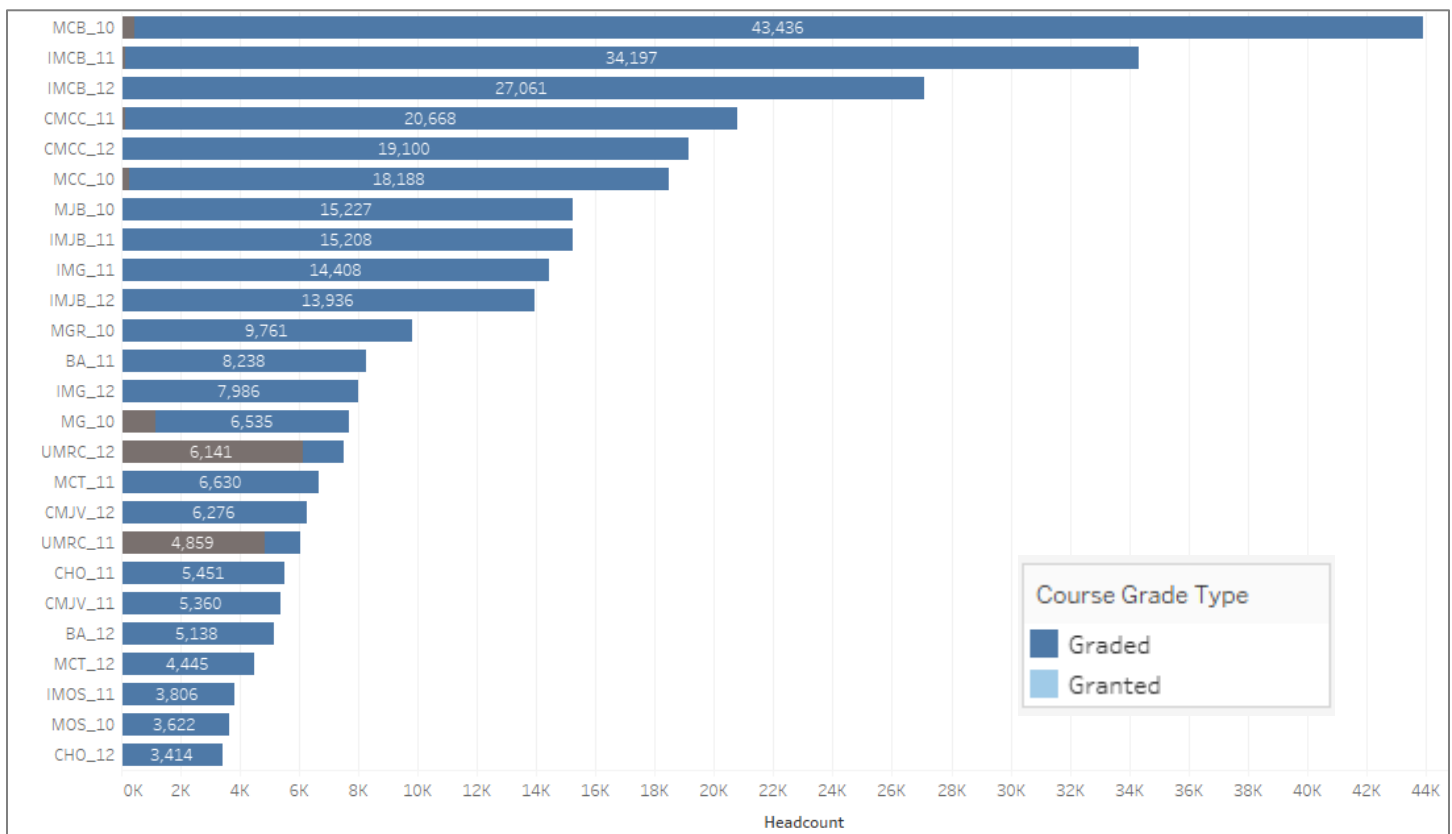
FIGURE 3: TEN-YEAR TREND IN HEADCOUNT AND % SHARE OF GRADE 12 GRADUATES WITH MUSIC EXPERIENCE



Among students with music experience, what were the top 25 most popular courses completed?

A total of 100 unique music courses were completed by the 147,268 grade 12 graduates with music experience. The top 25 courses, by number of course completers, is shown in the figure below. The number of course completers who received a regular grade are shown as 'Graded' and the number who were granted standing are shown as 'Granted'.

FIGURE 4: GRADE 12 GRADUATES WITH MUSIC EXPERIENCE, BY TOP 25 COURSES



Among students with music experience, what are the course codes of the 100 music courses completed?

A total of 100 unique music courses were completed by the 147,268 grade 12 graduates with music experience. When summed across all music courses, the headcount registrants in music courses was 331,859, for an average of 2.25 courses per student.

FIGURE 5: GRADE 12 GRADUATES WITH MUSIC EXPERIENCE – ALL MUSIC COURSES COMPLETED, WITH AVERAGE COURSE GRADE %

Course Code	Graded			Course Grade Type Granted			Grand Total		
	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade
APMU_12	199	0.1%	88.4	4	0.0%		203	0.1%	88.4
BA_11	8,238	2.6%	86.0	32	0.2%		8,270	2.5%	86.0
BA_12	5,138	1.6%	87.6	2	0.0%		5,140	1.5%	87.6
CHO_11	5,451	1.7%	84.8	63	0.4%		5,514	1.7%	84.8
CHO_12	3,414	1.1%	86.1	10	0.1%		3,424	1.0%	86.1
CHOF_11	31	0.0%	88.5				31	0.0%	88.5
CHOF_12	18	0.0%	90.5				18	0.0%	90.5
CMCC_11	20,668	6.6%	87.9	122	0.7%		20,790	6.3%	87.9
CMCC_12	19,100	6.1%	88.6	18	0.1%		19,118	5.8%	88.6
CMCCF_11	2	0.0%	84.0				2	0.0%	84.0
CMJV_11	5,360	1.7%	91.4	4	0.0%		5,364	1.6%	91.4
CMJV_12	6,276	2.0%	92.1	5	0.0%		6,281	1.9%	92.1
IBMCH_11	97	0.0%	85.7				97	0.0%	85.7
IBMCH_12A	65	0.0%	87.9				65	0.0%	87.9
IBMCS_11	100	0.0%	84.8				100	0.0%	84.8
IBMCS_12	72	0.0%	85.9				72	0.0%	85.9
IBMUM_11	61	0.0%	85.8				61	0.0%	85.8
IBMUM_12	30	0.0%	87.8				30	0.0%	87.8
IMCB_11	34,197	10.9%	88.8	122	0.7%		34,319	10.3%	88.8
IMCB_12	27,061	8.6%	90.0	19	0.1%		27,080	8.2%	90.0
IMCBF_11	49	0.0%	84.8				49	0.0%	84.8
IMCBF_12	49	0.0%	83.4	1	0.0%		50	0.0%	83.4
IMG_11	14,408	4.6%	82.2	26	0.1%		14,434	4.3%	82.2
IMG_12	7,986	2.5%	82.9	7	0.0%		7,993	2.4%	82.9
IMJB_11	15,208	4.8%	90.9	4	0.0%		15,212	4.6%	90.9
IMJB_12	13,936	4.4%	92.1	7	0.0%		13,943	4.2%	92.1

List continues on the following page.

FIGURE 5: GRADE 12 GRADUATES WITH MUSIC EXPERIENCE – ALL MUSIC COURSES COMPLETED, WITH AVERAGE COURSE GRADE %, CONT.

Course Code	Graded			Course Grade Type Granted			Grand Total		
	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade
IMJBF_11	73	0.0%	89.7				73	0.0%	89.7
IMJBF_12	90	0.0%	90.2				90	0.0%	90.2
IMOS_11	3,806	1.2%	89.9	12	0.1%		3,818	1.2%	89.9
IMOS_12	3,277	1.0%	91.3	2	0.0%		3,279	1.0%	91.3
IMOSF_11	3	0.0%	90.3				3	0.0%	90.3
MCB_10	43,436	13.8%	88.0	464	2.7%		43,900	13.2%	88.0
MCBF_10	129	0.0%	86.5				129	0.0%	86.5
MCC_10	18,188	5.8%	87.8	266	1.5%		18,454	5.6%	87.8
MCCF_10	3	0.0%	88.3				3	0.0%	88.3
MCFS_11	940	0.3%	84.2	6	0.0%		946	0.3%	84.2
MCT_11	6,630	2.1%	83.8	43	0.2%		6,673	2.0%	83.8
MCT_12	4,445	1.4%	85.7	27	0.2%		4,472	1.3%	85.7
MCTF_11	13	0.0%	94.2				13	0.0%	94.2
MCTF_12	4	0.0%	90.3				4	0.0%	90.3
MG_10	6,535	2.1%	86.3	1,144	6.6%		7,679	2.3%	86.3
MGF_10	73	0.0%	85.6	1	0.0%		74	0.0%	85.6
MGR_10	9,761	3.1%	82.3	57	0.3%		9,818	3.0%	82.3
MJB_10	15,227	4.8%	90.4	15	0.1%		15,242	4.6%	90.4
MJBF_10	168	0.1%	88.6				168	0.1%	88.6
MOS_10	3,622	1.2%	89.0	22	0.1%		3,644	1.1%	89.0
MOSF_10	1	0.0%	86.0				1	0.0%	86.0
MUCO_11	342	0.1%	87.4	13	0.1%		355	0.1%	87.4
MUCO_12	550	0.2%	87.8	2	0.0%		552	0.2%	87.8
MVJ_10	3,054	1.0%	90.7	11	0.1%		3,065	0.9%	90.7
STR_11	2,436	0.8%	82.0	6	0.0%		2,442	0.7%	82.0
STR_12	1,199	0.4%	84.7	1	0.0%		1,200	0.4%	84.7
UABM_10	8	0.0%	86.5	77	0.4%		85	0.0%	86.5
UABM_11	23	0.0%	85.7	135	0.8%		158	0.0%	85.7
UABM_12	20	0.0%	85.8	102	0.6%		122	0.0%	85.8

List continues on the following page.

FIGURE 5: GRADE 12 GRADUATES WITH MUSIC EXPERIENCE – ALL MUSIC COURSES COMPLETED, WITH AVERAGE COURSE GRADE %, CONT.

Course Code	Graded			Course Grade Type Granted			Grand Total		
	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade
UBCCM_10	17	0.0%	82.5	131	0.8%		148	0.0%	82.5
UBCCM_11	43	0.0%	86.5	181	1.0%		224	0.1%	86.5
UBCCM_12	45	0.0%	84.8	245	1.4%		290	0.1%	84.8
UBDJ_12	6	0.0%	88.2	16	0.1%		22	0.0%	88.2
UCCM_10	1	0.0%	60.0	37	0.2%		38	0.0%	60.0
UCCM_11	1	0.0%	60.0	26	0.1%		27	0.0%	60.0
UCCM_12				15	0.1%		15	0.0%	
UIOP_12				2	0.0%		2	0.0%	
ULCM_10				5	0.0%		5	0.0%	
ULCM_11	8	0.0%	87.0	22	0.1%		30	0.0%	87.0
ULCM_12	2	0.0%	97.5	19	0.1%		21	0.0%	97.5
ULMMT_11	3	0.0%	96.7	1	0.0%		4	0.0%	96.7
UMRC_10	436	0.1%	84.8	2,388	13.7%		2,824	0.9%	84.8
UMRC_10B				10	0.1%		10	0.0%	
UMRC_11	1,166	0.4%	84.6	4,859	27.9%		6,025	1.8%	84.6
UMRC_11B				16	0.1%		16	0.0%	
UMRC_12	1,354	0.4%	84.2	6,141	35.3%		7,495	2.3%	84.2
UMRC_12B	2	0.0%	84.5	37	0.2%		39	0.0%	84.5
UMRC_12C	1	0.0%	90.0	2	0.0%		3	0.0%	90.0
UMRC_12D	1	0.0%	82.0	1	0.0%		2	0.0%	82.0
UMRC_12E	1	0.0%	74.0	2	0.0%		3	0.0%	74.0
UMVC_10	8	0.0%	87.1	12	0.1%		20	0.0%	87.1
UMVC_11	18	0.0%	87.5	26	0.1%		44	0.0%	87.5
UMVC_12	12	0.0%	88.5	30	0.2%		42	0.0%	88.5
UMWB_10	1	0.0%	95.0	3	0.0%		4	0.0%	95.0
UMWB_10A	14	0.0%	90.1	52	0.3%		66	0.0%	90.1
UMWB_10B				16	0.1%		16	0.0%	
UMWB_10C	1	0.0%	76.0	10	0.1%		11	0.0%	76.0
UMWB_11	12	0.0%	82.2	18	0.1%		30	0.0%	82.2

List continues on the following page.

FIGURE 5: GRADE 12 GRADUATES WITH MUSIC EXPERIENCE – ALL MUSIC COURSES COMPLETED, WITH AVERAGE COURSE GRADE %, CONT.

Course Code	Graded			Course Grade Type Granted			Grand Total		
	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade	Headcount	% of Total	Avg % Grade
UMWB_11A	11	0.0%	87.7	45	0.3%		56	0.0%	87.7
UMWB_11B	2	0.0%	82.5	4	0.0%		6	0.0%	82.5
UMWB_11C				9	0.1%		9	0.0%	
UMWB_12	11	0.0%	85.9	17	0.1%		28	0.0%	85.9
UMWB_12A	12	0.0%	86.1	45	0.3%		57	0.0%	86.1
UMWB_12B	1	0.0%	87.0	9	0.1%		10	0.0%	87.0
UMWB_12C				10	0.1%		10	0.0%	
UROK_10	1	0.0%	86.0	16	0.1%		17	0.0%	86.0
UROK_11				8	0.0%		8	0.0%	
UROK_12				8	0.0%		8	0.0%	
UTCM_10	2	0.0%	90.0	9	0.1%		11	0.0%	90.0
UTCM_11	3	0.0%	80.7	10	0.1%		13	0.0%	80.7
UTCM_12				6	0.0%		6	0.0%	
UTCMT_10	2	0.0%	78.0	8	0.0%		10	0.0%	78.0
UTCMT_11	1	0.0%	85.0	5	0.0%		6	0.0%	85.0
UTCMT_12				6	0.0%		6	0.0%	
Grand Total	314,469	100.0%	88.0	17,390	100.0%		331,859	100.0%	88.0

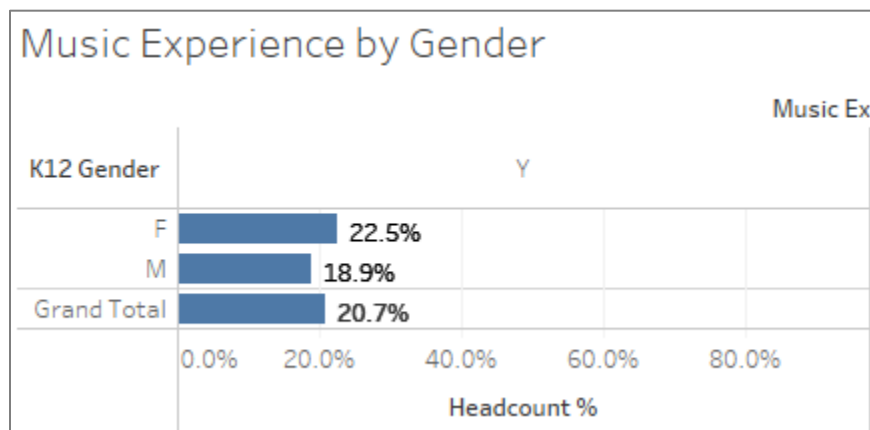
Refer to the Ministry of Education Course Registry for full course titles and descriptions of courses at:

https://www.bced.gov.bc.ca/datacollections/course_registry_web_search/course-code-lookup.php

Are there any differences in the proportion of students with music experience, by gender?

A greater proportion of female students (22.5%) had music experience in high school than male students (18.9%).

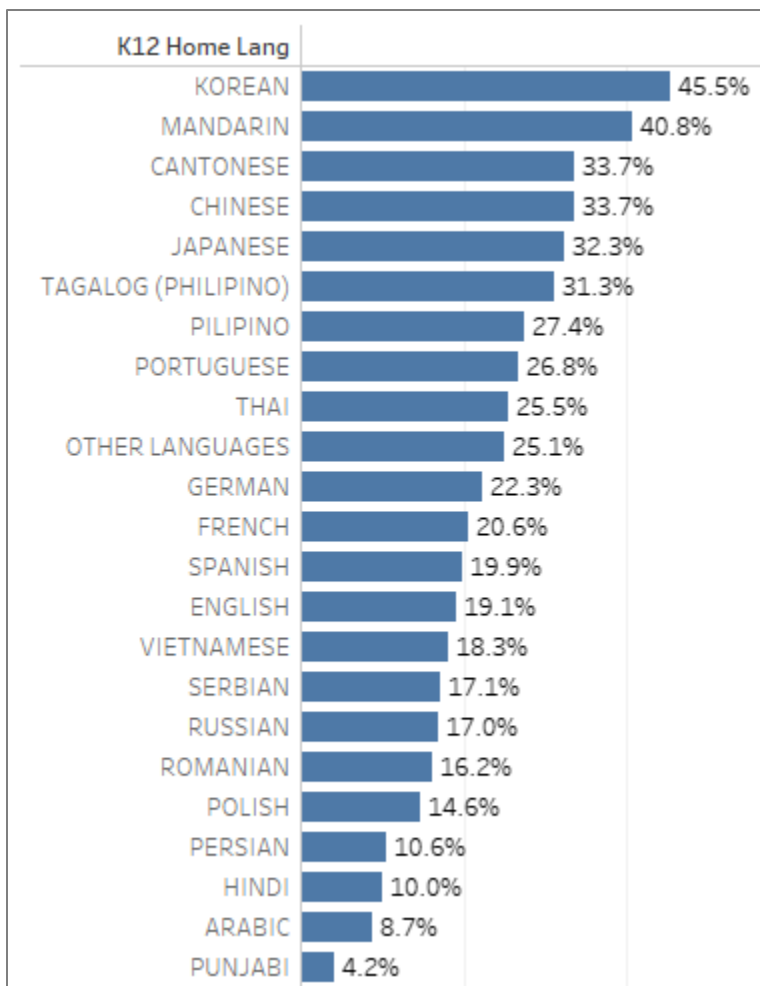
FIGURE 6: PROPORTION OF STUDENTS WITH MUSIC EXPERIENCE, BY GENDER



What was the range in the proportion of students with music experience, by primary language spoken at home (as a proxy for ethnic origin)?

Among students whose primary language was reasonably popular (spoken by at least 100 students in the cohort), this study shows that students who primarily speak English at home, were less likely at 19.1% to have had music experience in high school when compared to the proportion with music experience among all students in the cohort (20.7%). Numerous other primary language groups of students were much more likely to have had music experience in high school, including: Korean (45.5%), Mandarin (40.8%), Cantonese (33.7%), Chinese (33.7%), Japanese (32.3%), Tagalog (31.3%) and others.

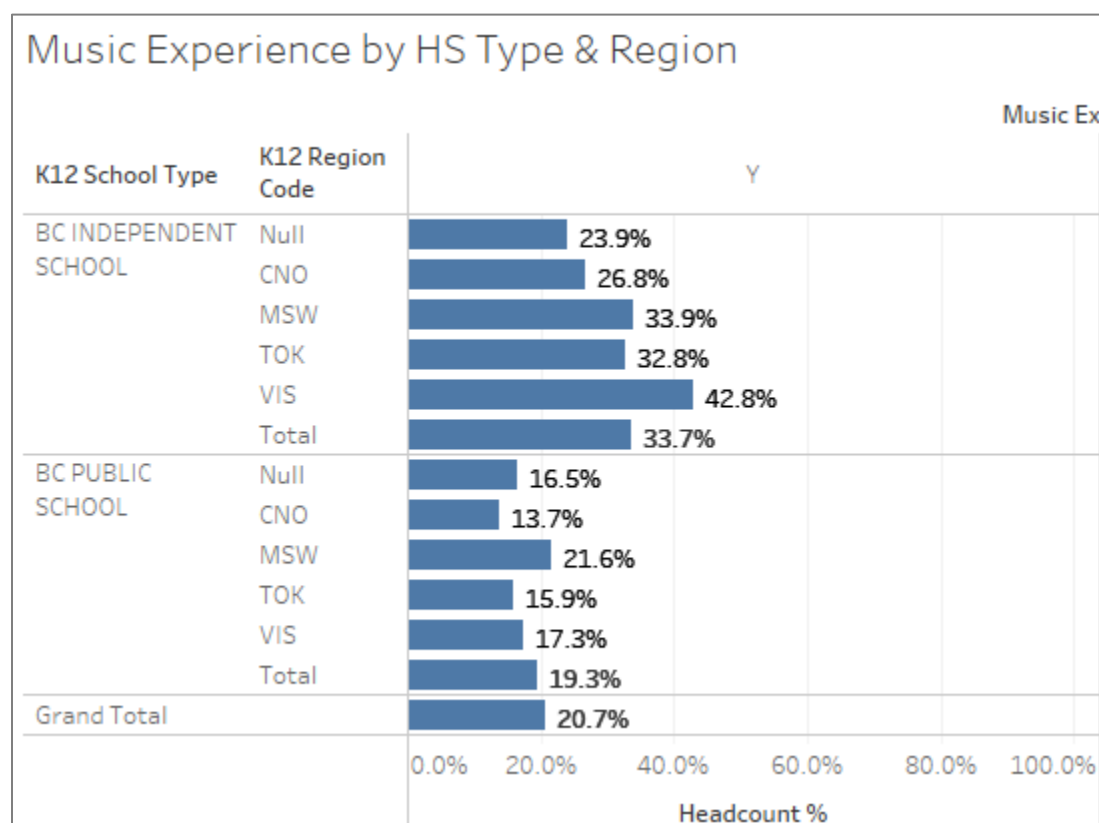
FIGURE 7: PROPORTION OF STUDENTS WITH MUSIC EXPERIENCE, BY PRIMARY LANGUAGE SPOKEN AT HOME



How does the proportion of students with music experience vary by public versus private high school and region of the province?

A greater proportion of students in private or independent high schools in B.C. had music experience (33.7%), than students who graduated from B.C. public high schools (19.3%). Students who graduated from independent high schools on Vancouver Island (VIS) had the greatest exposure to music courses in high school (42.8%). By comparison, students from public high schools in the Cariboo-North Region of B.C. had the least exposure to music classes (13.7%).

FIGURE 8: PROPORTION OF STUDENTS WITH MUSIC EXPERIENCE, BY HIGH SCHOOL TYPE AND REGION

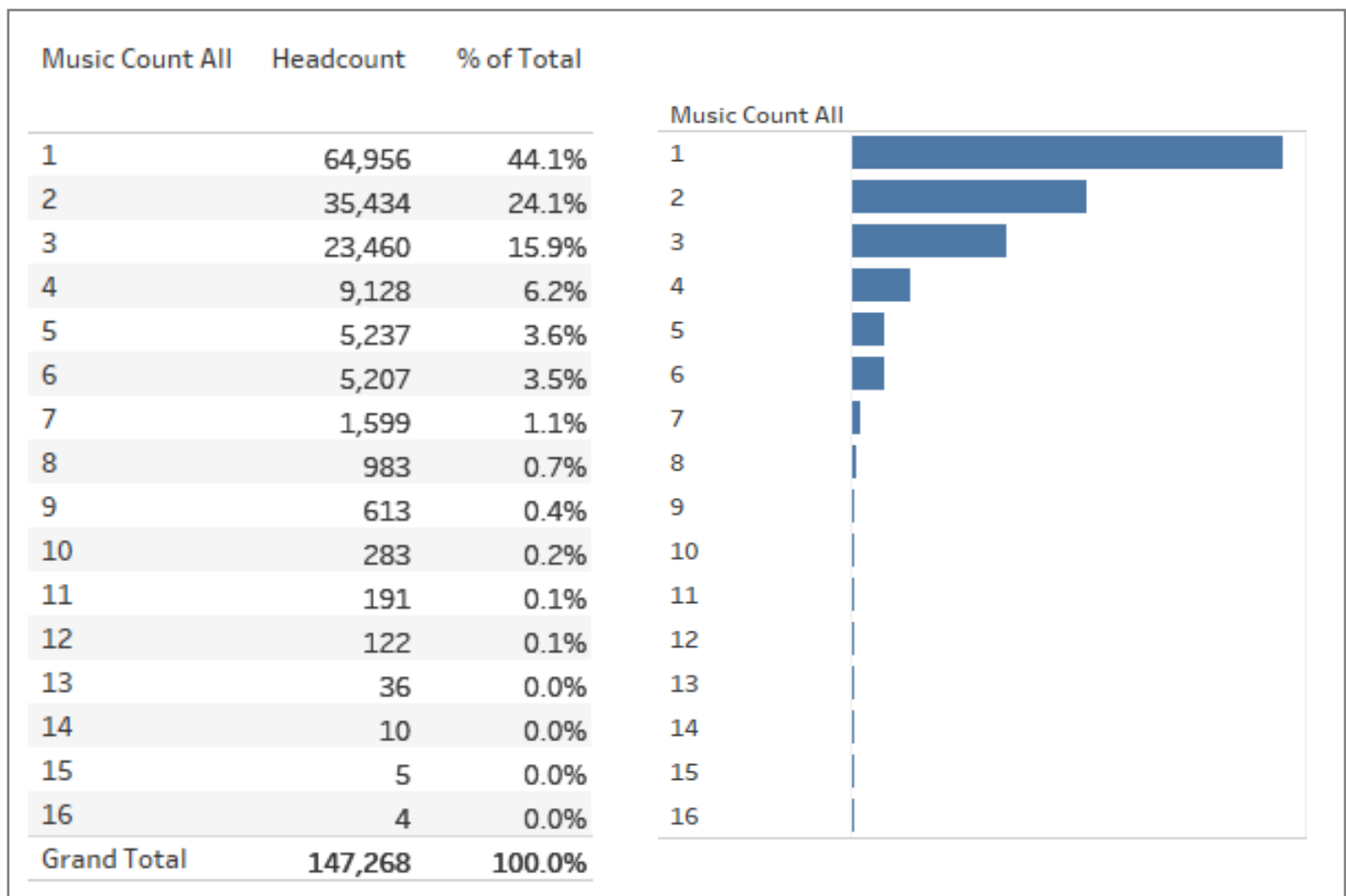


B.C. Regions: Cariboo-North (CNO), Mainland/Southwest (MSW), Thompson-Okanagan-Kootenays (TOK) and Vancouver Island/Coast (VIS).

Among students with music experience, on average, how many music courses did they take and what is the distribution of the number of music courses taken?

Among students with music experience, they took an average of 2.25 courses. This is based on 147,268 students taking a total of 331,859 music courses, among grade 12 graduates of 2001/2002 to 2016/2017. More than half (55.9%) of the cohort completed two or more music courses.

FIGURE 9: FREQUENCY DISTRIBUTION OF NUMBER OF MUSIC COURSES COMPLETED BY STUDENTS WITH MUSIC EXPERIENCE

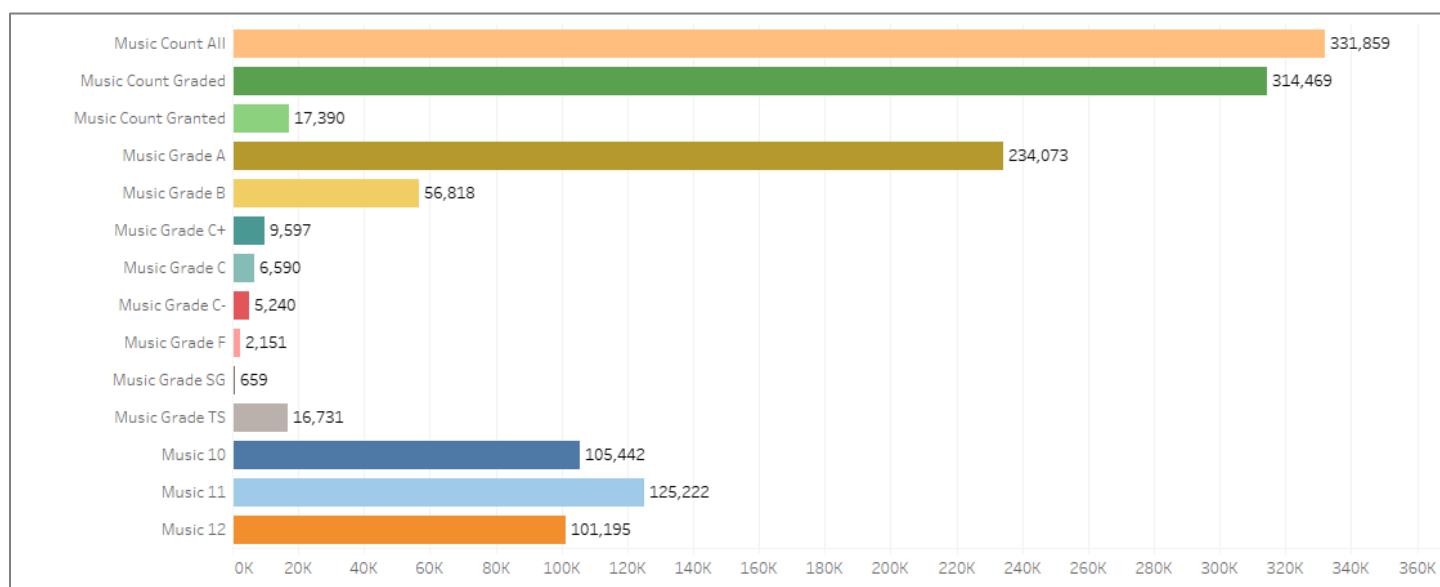


Among students with music experience, what is the distribution of courses by grade level, course recognition status and letter grade?

Of those 147,268 students who took at least one music course in high school, they took a total of 331,859 music courses prior to graduating from grade 12.

- **Grade Level** - These music courses were spread roughly equally over 3 grade levels: grade 10 (32%), grade 11 (38%) and grade 12 (30%).
- **Course Recognition Status** - The majority (95%) of these music courses were graded by the student's high school, but a small portion (5%) of the music courses were recognized as complete, but with grades of SG (Standing Granted³) or more commonly TS (Transfer Standing⁴). These courses were likely externally completed music courses, such as Royal Conservatory of Music exams.
- **Letter Grade**⁵ – Among those 314,469 music courses that received a standard letter grade, the majority of grades awarded were A's (74%) and B's (18%), with a small share (7%) earning a grade below 'B'.

FIGURE 10: NUMBER OF MUSIC COURSES COMPLETED BY STUDENTS WITH MUSIC EXPERIENCE, BY COURSE RECOGNITION, LETTER GRADE AND GRADE LEVEL



³ **SG=Standing Granted:** Although completion of normal requirements is not possible, a sufficient level of performance has been attained to warrant, consistent with the best interests of the student, the granting of standing for the course or subject and grade. Standing Granted may be used in cases of serious illness, hospitalization, late entry or early leaving, but may only be granted by an adjudication process authorized by the principal, vice principal or director of instruction in charge of the school. Standing Granted may not be used for a course with a Required Graduation Program Examination.

⁴ **TS=Transfer Standing:** May be granted by the principal, vice principal or director of instruction in charge of a school on the basis of an examination of records from an institution other than a school as defined in the School Act. Alternatively, the principal, vice principal or director of instruction in charge of a school may assign a letter grade on the basis of an examination of those records.

⁵ **B.C. Ministry of Education Grading Scheme:** A (86-100%), B (73-85%), C+ (67-72%), C (60-66%), C- (50-59%), F (0-49%).

Do students with high school music experience achieve higher education outcomes than students without music experience?

By comparing the education outcomes of students with music experience (N=147,268) to those without music experience (N=563,384), it was found that students with music experience generally achieved higher education outcomes than students without music experience.

(a) **Average iGPA scores** –Regardless of post-secondary transition status or time of entry, students with music experience consistently had higher iGPAs, on average, than students without music experience (80.3 versus 76.7). See [Figure 11](#).

- Immediate-entry (82.1 versus 79.3).
- Delayed-entry (76.9 versus 74.0).
- No transition to post-secondary education yet (78.7 versus 74.0).

(b) **Average Academic GPA (AGPA) scores** (as a measure of university eligibility) - Again, students with music experience had higher AGPA scores than non-music students, regardless of post-secondary entry status (83.7 versus 81.1). See [Figure 11](#).

- Immediate-entry (83.8 versus 81.6).
- Delayed-entry (81.0 versus 78.3).
- No transition yet (85.1 versus 81.8).

(c) **Transition Rates to B.C. public post-secondary education** – On this measure, it was found that students with music experience transitioned to B.C. public post-secondary education at similar rates to those without music experience (72.8% versus 73.0%). The transition rates were measured over the long-run (up to sixteen years, depending upon the graduation cohort). When immediate-entry transition rates were compared between the two groups, clearly the students with music experience had higher transition rates (55.7%) than students without music experience (51.1%). A larger proportion of students without music experience had a delayed transition to post-secondary education (21.8%) than students with music experience (17.2%). Numerous studies by the STP have revealed that students with lower academic qualifications are more likely to delay their transition to post-secondary education than students with higher academic qualifications. See [Figure 11](#).

(d) **Post-Secondary Destination** – Among students who transitioned to post-secondary education, students with music experience were more inclined than non-music students to first enrol in an RIU or research-intensive university (41.1% versus 27.2%). Post-secondary transitioners without music experience showed a greater propensity to first enrol in teaching-intensive universities or TIUs (28.6% versus 24.2%) and Colleges/Institutes (44.2% versus 34.7%) than students with music experience. Other studies by the STP have shown that students with higher academic qualifications are more likely to enrol in RIUs than other institution types (TIUs, colleges and institutes). Students who enrolled in Visual and Performing Arts post-secondary programs had more music experience (36.4%) than all post-secondary entrants combined (20.7%). See [Figure 12](#).

(e) **Post-secondary credential completion rates** – Among all students in the cohort who transitioned to post-secondary education at various points in time, students with music experience achieved higher credential completion rates (52.5%) than students without music experience (50.0%). This measure includes all types of credentials completed over the sixteen years, ranging from short certificates to Bachelor's degrees and Master's degrees, etc., but the STP is also able to focus on specific credential categories. The results show that students with music experience who enrolled in post-secondary education and subsequently earned a credential were more likely (and faster) to earn a Bachelor's degree as their first credential than students without music experience (29.7% in 4.4 years versus 22.6% in 4.6 years). Students without music experience (23.5%) earned a higher proportion of certificates and diplomas, compared to music students (18.6%). See [Figure 13](#).

FIGURE 11: COMPARISON OF STUDENT OUTCOMES - STUDENTS WITH MUSIC EXPERIENCE VERSUS STUDENTS WITHOUT MUSIC EXPERIENCE

Outcomes Compared	Music Experience		Grand Total
	Y	N	
Headcount	147,268	563,384	710,652
Headcount %	20.7%	79.3%	100.0%
Avg. K12 Grad Igpa	80.3	76.7	77.4
Avg. K12 Grad Agpa	83.7	81.1	81.8
Avg. K12 Grad Igpa Course Cnt	11.0	10.6	10.7
Avg. Psi Delay Years	0.6 Yrs	0.8 Yrs	0.7 Yrs
% Psi Transitioner	72.8%	73.0%	72.9%
% Psi Immediate Entry	55.7%	51.1%	52.1%
% Psi Delayed Entry	17.2%	21.8%	20.9%
% Psi Non-Transitioner	27.2%	27.0%	27.1%

FIGURE 12: COMPARISON OF STUDENT OUTCOMES (AMONG POST-SECONDARY TRANSITIONERS ONLY) – STUDENTS WITH MUSIC EXPERIENCE VERSUS STUDENTS WITHOUT MUSIC EXPERIENCE

Transitioners Only - Outcomes Compared	Music Experience		Grand Total
	Y	N	
Headcount	107,263	411,139	518,402
Headcount %	20.7%	79.3%	100.0%
Avg. K12 Grad Igpa	80.9	77.7	78.4
Avg. K12 Grad Agpa	83.4	81.0	81.6
Avg. K12 Grad Igpa Course Cnt	10.9	10.6	10.6
Avg. Psi Delay Years	0.6 Yrs	0.8 Yrs	0.7 Yrs
% Psi Transitioner	100.0%	100.0%	100.0%
% Psi Immediate Entry	76.4%	70.1%	71.4%
% Psi Delayed Entry	23.6%	29.9%	28.6%
% Psi Non-Transitioner	0.0%	0.0%	0.0%
% Psi RIU Entry	41.1%	27.2%	30.0%
% Psi TIU Entry	24.2%	28.6%	27.7%
% Psi College/Inst. Entry	34.7%	44.2%	42.2%
% Psi Credential Completer	52.5%	50.0%	50.5%
Avg. Time to Completion (Years)	3.6 Yrs	3.4 Yrs	3.4 Yrs

FIGURE 13: CREDENTIAL COMPLETION STATISTICS OF POST-SECONDARY TRANSITIONERS – STUDENTS WITH MUSIC EXPERIENCE VERSUS NO MUSIC EXPERIENCE

Credential Completions

Firstcred Credential Category	Music Experience					
	Y			N		
	Headcount	Headcount % along Firstcred Credential Category	Avg. Psi TTC	Headcount	Headcount % along Firstcred Credential Category	Avg. Psi TTC
Null	50,925	47.5%		205,575	50.0%	
ADVANCED CERTIFICATE	79	0.1%	3.9	170	0.0%	4.2
ADVANCED DIPLOMA	49	0.0%	4.0	220	0.1%	4.3
APPRENTICESHIP	248	0.2%	2.0	1,994	0.5%	2.0
ASSOCIATE DEGREE	1,929	1.8%	3.0	6,826	1.7%	3.1
BACHELORS DEGREE	31,897	29.7%	4.4	92,753	22.6%	4.6
CERTIFICATE	11,089	10.3%	1.8	59,035	14.4%	1.7
DEVELOPMENTAL CREDE..	260	0.2%	1.2	1,090	0.3%	0.9
DIPLOMA	8,916	8.3%	2.9	37,285	9.1%	3.1
DOCTORATE	10	0.0%	7.4	22	0.0%	6.2
FIRST PROFESSIONAL DE..	737	0.7%	4.9	1,352	0.3%	5.0
GRADUATE CERTIFICATE	12	0.0%	3.5	29	0.0%	5.7
GRADUATE DIPLOMA	1	0.0%	7.0	10	0.0%	2.8
MASTERS DEGREE	252	0.2%	3.4	620	0.2%	3.9
NONE	10	0.0%	2.2	43	0.0%	1.4
OTHER	52	0.0%	2.5	118	0.0%	2.5
POST-DEGREE CERTIFICA..	15	0.0%	3.8	32	0.0%	4.0
POST-DEGREE DIPLOMA	55	0.1%	3.3	159	0.0%	4.2
RECOMMENDATION FOR ..	25	0.0%	4.8	63	0.0%	5.3
SHORT CERTIFICATE	702	0.7%	2.8	3,743	0.9%	2.8
Grand Total	107,263	100.0%	3.6	411,139	100.0%	3.4

Are there proportionately more students with music experience among high academic achievers than moderate achievers?

To answer this question, the STP looked at the relative proportions of students with music experience among high achievers versus moderate achievers, across a number of different education outcomes. The findings show that proportionately more of the successful students had music experience in high school, where success was measured and compared along five different education outcomes: (a) average iGPA scores, (b) transition to post-secondary education, (c) time of entry to post-secondary education, (d) post-secondary credential completion, and (e) type of post-secondary credential completed. Regardless of the education outcome, a larger proportion of high achievers had music experience than moderate achievers (see [Figure 14](#)).

(a) Average iGPA scores (High Achievers versus Moderate Achievers) - Roughly one-quarter (24.8%) of high-achievers (with iGPA scores above 75%) had music experience in high school. This is significantly greater than the proportion of moderate achievers with music experience (14.9%). Similar results were found using AGPA scores (27.7% versus 19.0%).

(b) Transition to Post-Secondary Education – On average, regardless of academic performance in high school, the proportion of music students among post-secondary transitioners was virtually equal to those who did not transition to B.C. public post-secondary education (20.7% versus 20.8%), but there were larger differences when transitioners and non-transitioners were examined separately.

- Among post-secondary **transitioners**, proportionately more of the high-achieving students had music experience in high school (23.9%) than moderate-achievers (15.0%).
- Similarly, among **non-transitioners**, an even larger proportion of high-achieving students had music experience in high school (27.8%) than moderate achieving non-transitioners (14.8%). It seems counter-intuitive that a greater share of high-achieving music students are found among those who did not transition to B.C. public post-secondary education (27.8%), when compared to those who did transition (23.9%), but this is likely due to the distortion effect on transition rates, whereby students who enrolled in B.C. private and non-B.C. institutions are not accounted for⁶.

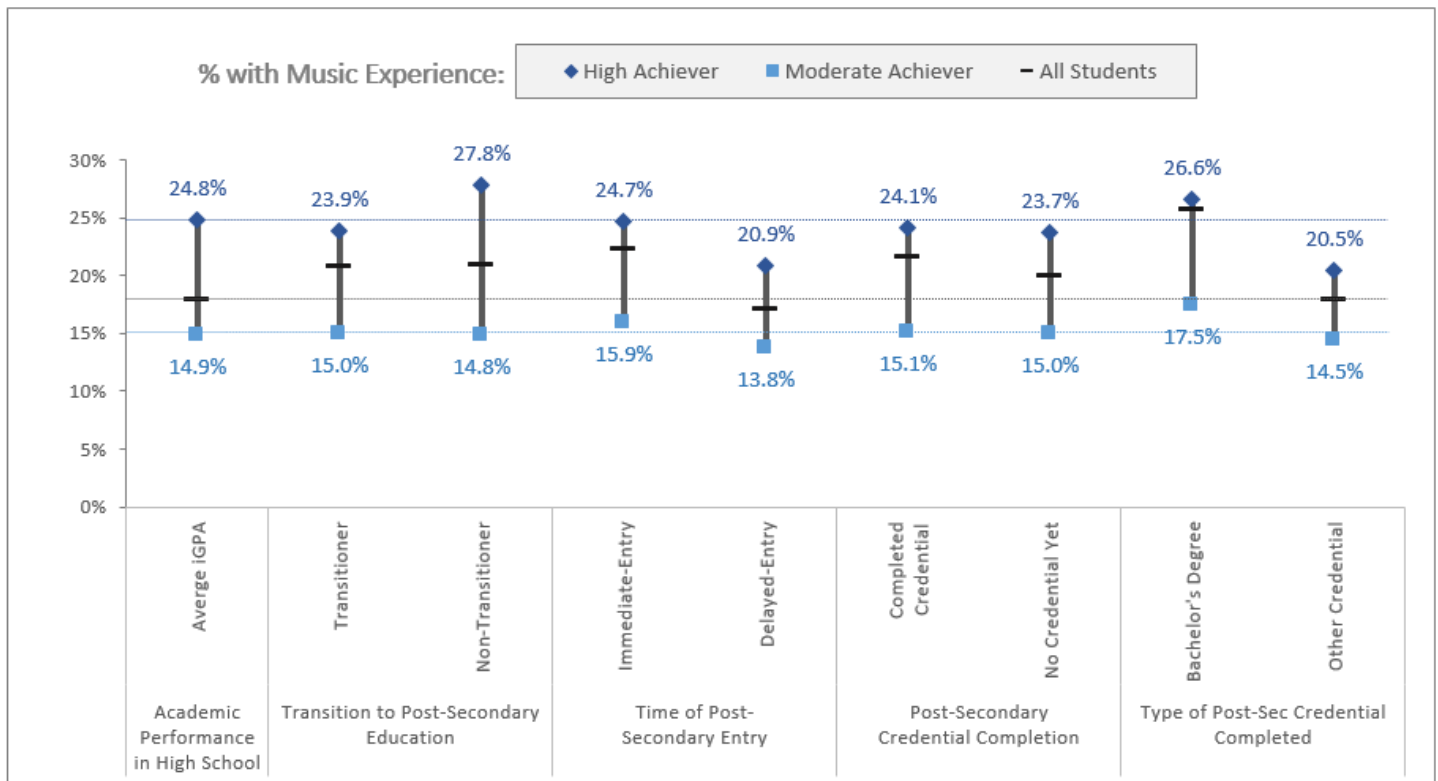
(c) Time of Post-Secondary Entry (Immediate versus Delayed) – A larger proportion of immediate entry students had music experience in high school (22.2%) than delayed-entry students (17.0%). Regardless of whether students enrolled immediately in post-secondary education or delayed their entry, a higher proportion of music students were found among the high achievers than moderate achievers.

(d) Post-secondary credential completion – A slightly larger proportion of credential completers had music experience in high school (21.5%) than non-completers of credentials (19.9%). Proportionately more of the high achievers than moderate achievers had music experience in high school, among both the credential completers and non-completers.

(g) Type of post-secondary credential completed – A larger proportion of Bachelor's completers had music experience in high school (26.5%) than those who completed a developmental credential (19.3%) or some other credential (17.8%). Regardless of the credential completed, a larger proportion of high achievers had music experience than moderate achievers.

⁶ STP [research](#) conducted in 2010 reported that very high achievers, with GPA's in the range of 85% to 100%, are increasingly likely, as GPA increases, to enrol in non-B.C. post-secondary institutions. Students reported as "non-transitioning" high achievers in this study may have enrolled in post-secondary education outside of B.C.

FIGURE 14: COMPARISON OF THE PROPORTION OF STUDENTS WITH MUSIC EXPERIENCE: HIGH VERSUS MODERATE ACADEMIC ACHIEVERS, BY EDUCATION OUTCOME



Do students with music experience achieve higher grades in selected high school courses?

Using the academic course grade information in the STP, it is possible to examine specific course performance for students with music experience and compare this performance to those without music experience. For each of the grade 12 courses required for grade 12 graduation, it is possible to compare the grade distributions of those with music experience to those without music experience.

The Figure below provides an example comparing math 11 grades between those with music experience and those without music experience. A larger proportion of students with music experience achieved A's and B's (62.9%) than students without music experience (51.2%). The STP has access to course grade information for the numerous courses that students completed for grade 12 graduation, but no additional STP resources were allocated at this time to pursue further course level analysis in this study.

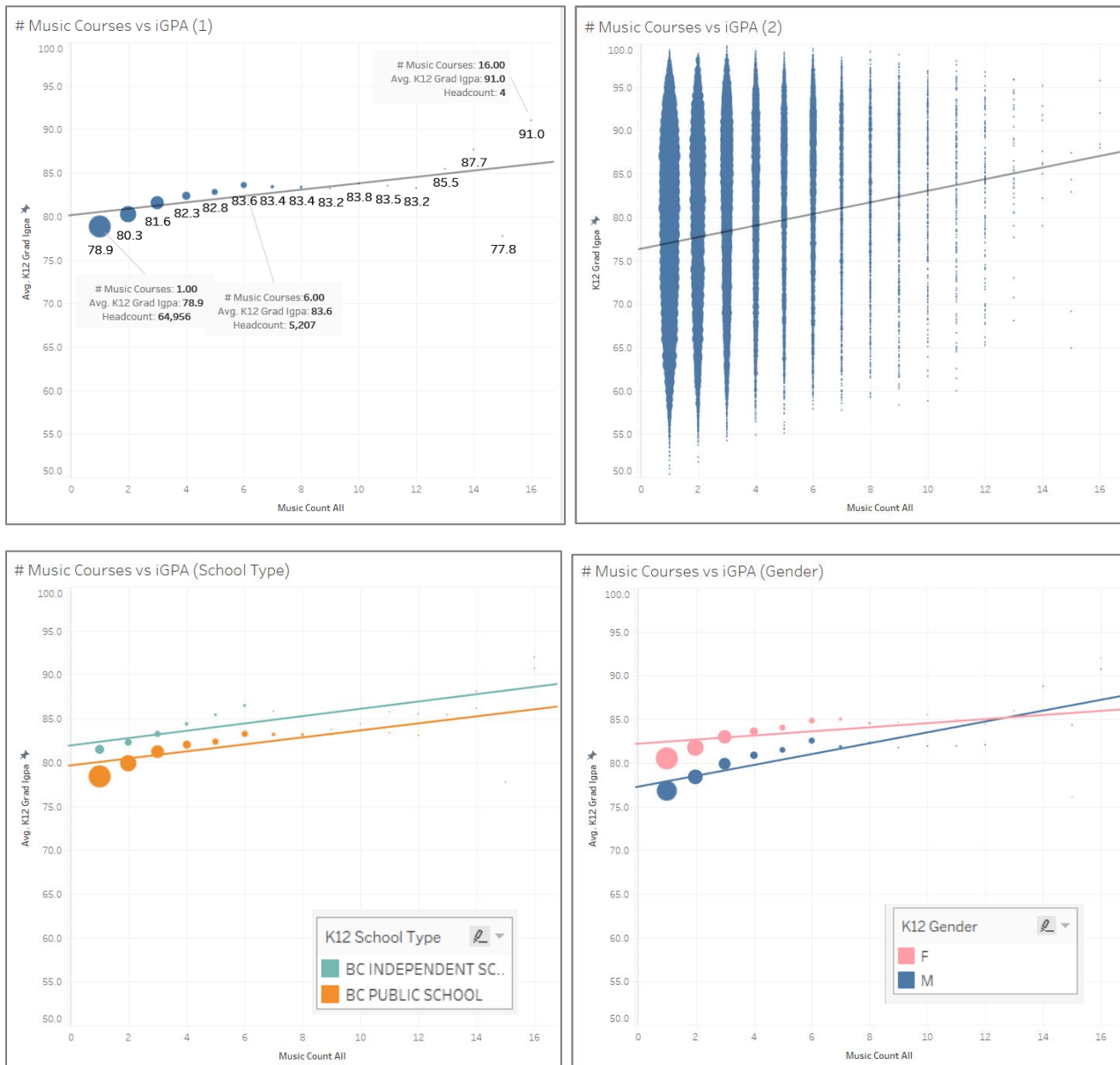
FIGURE 15: COMPARISON OF GRADE DISTRIBUTIONS IN MATH 11: STUDENTS WITH VS WITHOUT MUSIC EXPERIENCE

Math 11		Music Experience		
Igpa Crs06 ...		Y	N	Grand T..
Null	Headcount	9,297	37,830	47,127
	Headcount % along Igpa C..	6.3%	6.7%	6.6%
A	Headcount	55,176	135,023	190,199
	Headcount % along Igpa C..	37.5%	24.0%	26.8%
B	Headcount	37,464	153,200	190,664
	Headcount % along Igpa C..	25.4%	27.2%	26.8%
C	Headcount	14,664	76,001	90,665
	Headcount % along Igpa C..	10.0%	13.5%	12.8%
C-	Headcount	16,131	90,313	106,444
	Headcount % along Igpa C..	11.0%	16.0%	15.0%
C+	Headcount	14,511	70,878	85,389
	Headcount % along Igpa C..	9.9%	12.6%	12.0%
F	Headcount	25	139	164
	Headcount % along Igpa C..	0.0%	0.0%	0.0%
Grand Total	Headcount	147,268	563,384	710,652
	Headcount % along Igpa C..	100.0%	100.0%	100.0%

Do students achieve higher iGPA scores, the more music courses they take?

There appear to be diminishing returns after six music courses, but it appears that the more music courses students take in high school, the higher their iGPA score upon graduation from grade 12. The relationship between the number of music courses completed and iGPA scores is consistently higher for independent (versus public) school graduates and females (versus males).

FIGURE 16: AVERAGE iGPA SCORES VS NUMBER OF MUSIC COURSES COMPLETED



Does music make you smarter or do smart kids take music?

This STP study looked only at correlations between music experience and academic achievement, thus we cannot answer this question. However, it may be possible to look at students who only had music experience in grade 12 and determine whether their academic course performance in various high school courses improved in grade 12, when compared to grade 10 and 11. The results of such analysis would not be conclusive, but might be interesting.



Source: www.activekids.com



Source: parent24.com

Conclusion

This report confirms many of the findings presented by Peter Gouzouasis, but more importantly, it extends the research possibilities further by providing preliminary evidence of other post-secondary academic achievement benefits for students who participated in music courses in B.C. public and independent secondary schools. This question still remains to be answered, however: *Does music make you smarter, or do smart kids take music?*

In this study, the STP data has proven to be a useful resource for identifying students with music experience and for exploring the differences in the secondary and post-secondary education outcomes, including high school GPAs, transition rates into post-secondary education, post-secondary institution and program destinations, and post-secondary credential completion rates.

Without controlling for socioeconomic background or prior education achievement in elementary school, this study found that students with high school music experience, when compared to students without music experience, achieved higher iGPAs, higher AGPAs, higher immediate-entry transition rates, higher rates of enrollment in research-intensive universities and higher post-secondary credential completion rates. These results support the importance of continuing to offer and encourage students to partake in music programs in B.C.'s K-12 education system.